

2010 REPORT OF THE COMMITTEE ON PARASITIC DISEASES

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The Committee met on November 17, 2010 at the Hilton Minneapolis, Minneapolis, Minnesota, from 8:00 am to 12:00 pm. There were 13 members and 21 guests present.

Drs. Muhammad Chaudhury, Pamela Phillips, Agustin Sagel, and Steven Skoda, United States Department of Agriculture (USDA), Agricultural Research Service (ARS), Knipling-Bushland U.S Livestock Insects Research Laboratory, Kerrville, Texas, gave an update on USDA-ARS Research on the Screwworm Fly. Screwworm myiasis is devastating to warm blooded animals. Eradication of the screwworm from mainland North America using the sterile insect technique is an unprecedented achievement; reinvasion is prevented by maintenance of a barrier at the Panama – Colombia border. Optimum approaches for barrier maintenance differ from eradication programs, yet much of the knowledge available was collected during eradication of screwworms from ecological zones that differ from the barrier zone. The USDA-ARS Screwworm Research Unit (SRU) currently investigates aspects of screwworm ecology, behavior, improvements in mass rearing, and genetics to enhance the current mission of barrier maintenance as well as improve prospects for future eradication efforts. Recent accomplishments, over the past 5 years, by SRU scientists include: 1) developing techniques towards the development of a genetic sexing, males-only strain of screwworm; 2) general improvements applied to the mass rearing of screwworms; 3) determining that screwworms are not vectors of viruses causing Foot and Mouth Disease or Hog Cholera; 4) developing standardized molecular genetic techniques useful for studying genetic diversity of screwworm populations; 5) applying Geographic Information Systems and Satellite Imagery to better define screwworm habitat. The SRU has recently initiated a new 5 year plan of research that builds on the recent accomplishments. If geographical features, such as wide expanses of water or mountains, serve as effective barriers to screwworm movement then genetic subtypes of screwworms may exist; samples will be studied from wide geographic origin using recently established molecular genetic techniques. Continuing work toward developing a male-only, genetic sexing strain of screwworms will result, once successful, in improved mass rearing efficiency for barrier maintenance; perhaps produce a more favorable cost:benefit ratio to where other nations could benefit from either eradication or area-wide control programs; should result in more competitive released sterile males because of the lower dose of irradiation necessary to sterilize males; and, because progeny of any accidentally released fertile flies would result in only males, would improve bio-security at the mass rearing facility. Defining the components of animal wounds that are attractive to female screwworms could result in improved timing and quantity of eggs available for the mass rearing facility; improved surveillance at the barrier, as well as in any new eradication effort, that accurately measures the gravid portion of screwworm populations; and an 'attract-and-kill' system could be developed that would be useful as part of the area-wide, multiple tactic eradication effort. Although the artificial diet currently used to mass rear screwworms is efficient, acquiring the raw materials is often unreliable; defining the critical dietary constituents for larval screwworm development could lead to changes in components or formulation that improves the reliability of acquiring supplies while maintaining high quality sterile fly production from the mass rearing facility.

Dr. Matthew Messenger, United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) gave a National Update on the Cattle Fever Tick Eradication Program. Cattle fever tick, *Rhipicephalus (=Boophilus) microplus* and *R. annulatus*,

outbreaks within the free areas and the permanent quarantine buffer zone of South Texas have increased dramatically since 2004. During fiscal year (FY) 2010, there were 90 newly-recorded fever tick-infested premises in South Texas. When compared to 160 during FY 2009, which was the second highest total number of infested premises recorded during a single FY since 1973, this number has been reduced substantially. The free-ranging movement of fever tick-infested, native white-tailed deer and various exotic ungulate species continues to be a challenge to the Program. At the same time, these deer are capable of maintaining fever tick populations on livestock-vacated pastures. Other important factors include the presence of established fever tick populations on the Mexican side of the Rio Grande, the presence of ticks on stray and smuggled Mexican livestock, and the lack of long-lasting treatments for ticks on livestock and deer. Funding for the Program was increased to \$13.1 million for FY 2010, an increase of over \$4 million from FY 2009. The increased funding, including emergency funding carry-over from FY 2009, has helped the Program begin initiating new and/or enhanced eradication strategies. These new initiatives include potentially constructing a tick control barrier using deer-proof fencing along the permanent quarantine line, providing personnel to inspect livestock for the voluntary livestock movement notification and inspection and selected livestock sale barns in South Texas, and supporting the development and implementation of currently unavailable anti-tick vaccines (Gavac) and new treatment methods (ivermectin-containing, self-medicating feed blocks). Continuing into FY 2011, APHIS and the Texas Animal Health Commission will continue the systematic treatment of fever tick-infested livestock and deer in both the free and permanent quarantine areas of South Texas, including the implementation of herd surveillance plans. In addition, APHIS will increase collaborations with the local, state, and national livestock industries, and increase communication with Mexican State and Federal government officials to improve cooperation between the eradication programs of both countries. Proposed funding for the Program for FY 2011 is \$13.3 million, a slight increase over the FY 2010 funding level.

Dr. Francisco Collazo-Mattei, United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) gave a report on the screwworm infestation of a dog imported from Venezuela. Screwworm (*Cochliomyia hominivorax*) is considered a major parasitic threat to livestock and all warm blooded animals, including humans, in the Americas. The last major outbreak of screwworm in the North American hemisphere was in Panama in 2001; this outbreak was rapidly eradicated using the pest management approach of release of sterile insects which continues today over the eastern Panamanian country. USDA estimates more than \$900 million a year of benefit to US livestock a year as a result of the eradication of screwworm. On April 30, 2010, a six year old male bull dog arrived in the United States from Venezuela after a short visit to the country with its owner. That same day of arrival, the owner noticed a wound above the dorsum of the tail base and the owner cleaned it with hydrogen peroxide. Two days later the owner noticed what appeared to be maggots in the wound. The owner removed the maggots and burned them. On May 3, 2010, the owner took the dog to a private veterinarian in South Florida for an evaluation where the practitioner found one maggot and called USDA to pick up the sample maggot for identification. An FADD Veterinarian from the MAIC was dispatched to pursue an FAD investigation on this case. Based on the history of recent travel the practitioner and the USDA FADD veterinarian's initial differential was that this was not the usual maggot case and treated it as if it was a screwworm infestation. The larva was identified as a New World Screwworm third instar larva. The dog was treated with Coumaphos and twice a day for seven consecutive days the inside quarters of the house and the yard were sprayed with Atroban. The dog was inspected twice on 7 day intervals. On May 13, 2010, after inspection from the FADD and after the wound had healed, the Atroban spray was suspended and the quarantine was released.

Dr. Cynthia Duerr, United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), International Services (IS), Comisión Panamá - Estados Unidos Para La Erradicación y Prevención Del Gusano Barrenador Del Ganado (COPEG) gave an update on Screwworm Eradication in the Americas. New World Screwworm (NWS)- *Cochliomyia hominivorax* is an indiscriminate parasite of all warm blooded animals, including humans. Fertile flies produce up to 1600 eggs and deposit clutches of approximately 200 eggs at wound borders, or at areas with liquid discharge. Larvae burrow into the tissue below, increasing the size of the wound and attracting additional flies to oviposit. Untreated wounds are generally fatal. Significant economic damages result from mortality, costs associated with treatment, and lowered production. Historically screwworm was endemic as far

north as Missouri, and seasonally affected areas all the way to the Canadian border. As the livestock industry grew in the early 20th century, and other diseases such Foot and Mouth were successfully eradicated (1929) by the USDA, producers called for eradication of NWS. Research started in 1934 when Knippling and Bushland were assigned to the problem. Within 20 years trials of the sterile insect technique achieved eradication in Curacao and an eradication program began in Florida. Over the next 50+ years eradication moved southward all the way to Panama. NWS remains endemic in various Caribbean countries and much of South America. APHIS currently participates in two bilateral commissions with two program sites; COMEXA and COPEG. The COMEXA site in Tuxtla, Mexico currently maintains a reserve colony and maintains capacity to resume sterile fly production. At the COPEG in Pacora, Panama, the program produces sterile flies and disperses these over the barrier zone, conducts field surveillance, and works with ARS on various research topics. The COPEG Panama facility was inaugurated in 2006 and initiated production in April of 2009. Current production is between 30 and 40 million flies per week, with a maximum production to date of 87 million flies per week and sufficient capacity to support dispersal over the barrier (28 million) and to treat any outbreak. Expansion of the COPEG plant to enable production of 160 million flies weekly is under consideration. Some differences between the Panamanian and Mexican plants include the diet mixture and the irradiation method. The pupae produced at Panama are hatched and spread over the 14,000 mi² Darien region. New eclosion methods modified for screwworm in Panama have improved the fly yield from as low as 65-70% of pupa to an average that is now consistently over 90%. Additional advantages of the new tower systems being used in Panama are decreased energy costs, decreased labor, and improved labor conditions for personnel involved in rearing the flies as compared with the traditional chamber maturation. Together this represents a savings of over \$300,000 yearly. Field Operations continues to conduct surveillance, monitor animal movement, and provide education and outreach. Panama continues to experience between 2 and 7 cases of screwworm in the barrier zone each year. There has not been any recurrence of cases in Colón Province since June 2009. The remainder of Central and North America remain free from this pest.

Dr. Joseph Corn, Southeastern Cooperative Wildlife Disease Study (SCWDS), University of Georgia, Athens, Georgia; and Dr. James Mertins, USDA-APHIS-National Veterinary Services Laboratories, Ames, Iowa, gave a report on exotic ectoparasites collected from wildlife in Florida during recent surveys for exotic livestock arthropods in the Southeastern United States. The SCWDS, in collaboration with the USDA-APHIS- VS, conducts surveys for exotic arthropods on free-ranging wildlife in the southeastern United States, U.S. Virgin Islands, and Puerto Rico. Surveys are conducted via capture and examination of free-ranging wildlife. Examples of recent collections from native wildlife and free-ranging exotic reptiles included ticks, mites and lice not previously reported in the United States. Additional examples were new host records for ticks and mites collected from established species of exotic reptiles. It is clear that a diversity of exotic ectoparasites are becoming established in Florida, and that new host-parasite relationships are developing among exotic and native ectoparasites, and exotic and native wildlife. Introductions of exotic arthropods have implications for domestic animal, wildlife, and human health, and early detection is critical to eradication.

National Equine Piroplasmosis Update

Angela M. Pelzel, DVM, USDA, APHIS, Veterinary Services

In October 2009, *Theileria (Babesia) equi* infection was confirmed in a herd of domestic Quarter Horses on a large ranch in south Texas. Nearly 2,500 horses were tested for equine piroplasmosis (EP) as part of the traceback and epidemiological investigation with a total of 412 *T. equi*-positive horses disclosed in connection with the outbreak. Active natural transmission of *T. equi* to horses on the index ranch was confirmed to have been occurring via *Amblyomma cajennense* and *Dermacentor variabilis* ticks. Epidemiological investigation and testing of the horses sold from the premises indicates that *T. equi* infection had likely been present in horses on the ranch since prior to 1990. In response to disclosure of the EP-infected herd in Texas, many states implemented movement testing requirements for horses originating in Texas. In November 2009, New Mexico began requiring EP testing of Quarter Horse racehorses entering New Mexico racetracks. Racetracks in other states subsequently began requiring EP testing to enter sanctioned racetracks. This recent enhanced surveillance and movement testing has to date led to the disclosure of 130 EP-positive horses in the U.S. These findings are unrelated to the 2009 Texas ranch outbreak and were found in a total of 16 states. Of the 130 EP-

positive horses, 124 are infected with *T. equi* and 6 are infected with *Babesia caballi*. The EP-infected horses include 103 Quarter Horse racehorses, 8 Thoroughbred racehorses, 1 Quarter Horse roping horse, and 18 horses previously imported to the U.S. before August 2005, when the complement fixation test was the required import test for EP. Investigation of the EP cases in racehorses has revealed no tick-borne transmission between horses, but indicates iatrogenic transmission via unsanitary management practices as the likely source of transmission. The National Equine Piroplasmiasis Working Group (NEPWG) consisting of state, federal, research, laboratory, and industry representatives was established in November 2009. The charge of the group was to provide perspectives and recommendations on equine piroplasmiasis in the U.S. to USDA, APHIS, Veterinary Services. Interim guidance drafted by the group in February 2010 led to the development of current VS policy on domestic EP reactors. Long-term recommendations from the

Dr. Dee Ellis, Texas Animal Health Commission, gave an update on the **Cattle Fever Tick Eradication Program, 2010**

TAHC internal activities;

- Train all field staff – new field employees statewide detailed to S. Texas for training
- 9 inspectors (AHT's) integrated into S. Texas response under USDA supervision
- Enhanced equipment to ensure self-sufficiency – purchased portable spray boxes, scratch chutes
- Held Tick table top for field managers with scenario outside S. Texas
- Actively participate in managerial decisions at Macro level and provide epi input
- Exploring MOU with Texas Parks and Wildlife to formalize working relationships

TAHC external activities;

- Support Research
 - Purchased GAVAC vaccine for future field trials
 - Assisted with validation of Dectomax by providing staff/IT support and product
 - Engaged in Ivomec Molasses MUMS validation process with Postive Feed, USDA, and FDA
- Support Outreach/Education efforts
 - Partner with state cattle industry organizations to provide continuous updates
 - Partner with Tx Agrilife Extension for outreach at local and state venues
 - Partner with USDA/APHIS/VS, ARS and NRCS
 - Partner with Texas Parks and Wildlife agency
 - US Customs and Border Protection
- Support CFT Program Field Efforts
 - Changed rules to include to validate herd plans and epidemiology concept
 - Work closely with VS management to ensure full utilization and support of activities by both agencies
 - Supported policy changes for wildlife evaluation, electronic filing systems, epi forms, test all cattle under ownership, provide legal support, enhanced mapping, etc...
 - Perform routine traces and field activities outside of S. Texas – assist in S. Texas

Dr. Kevin Varner, United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) provided an update on the ongoing tick eradication activities along the Rio Grande Border in South Texas by USDA and TAHC. A summary of the information provided is as follows: The Texas Cattle Fever Tick Eradication Program (CFTEP) reports a total of 26 Infested premises in the Free Area of Texas and 51 infested premises in the Permanent Quarantine Zone on 09/30/2010. These numbers represent a significant reduction from the prior year when 86 infested premises in the Free Area and 43 infested premises in the Permanent Quarantine zone were reported.

The tick activity level varies along the length of the Permanent Quarantine Zone. In recent years the bulk of the new infestations have been found in Starr and Zapata counties. The tick activity in these two adjoining counties is dramatically different.

Starr County identified 32 infested premises in the Free Area during the Spring of 2009. Since that time a small number of additional premises have been discovered. On 09/30/2010 Starr county was still

reporting 16 infested premises in the Free area and 8 in the Permanent Quarantine Zone. This county has not eliminated the infestations identified in 2009.

Zapata County identified 26 infested premises in the Free Area during the Spring of 2009. To a large extent those infestations have been eliminated. Over the past year this county has seen a steady stream of newly identified infested premises in the Permanent Quarantine Zone. These have originated from a dense population of tick infested deer that has been identified between Falcon Lake and Highway 83--- the boundary of the Permanent Quarantine Zone. This situation was complicated by flooding this summer which pushed the deer population against the Quarantine Zone boundary. In response the Cattle Fever Tick program has established and services hundreds of deer feeding sites in these areas.

The Cattle Fever Tick Eradication Program (CFTEP) was the only Veterinary Services program to receive a budget increase in FY 2010. This was due in large part to the support of the Texas Cattle Industry and Drs. Hillman and Dr. Ellis of TAHC. FY 2010 marked the beginning of a renewal process that is designed to refocus the CFTEP on it's baseline functions of patrol, servicing movements and eradication efforts while at the same time adopting proven modern disease eradication techniques and tools.

In FY 2010:

-the CFTEP purchased new equipment—i.e. converted the deer feeding operation from hand carried bags to a bulk feeding operation (28 ton overhead bins, trailer and truck mounted bulk feed hoppers and blowers), new trucks (lowered the mileage for replacement), IT equipment, portable dip vats, portable spray boxes, etc.

-the Texas Area added or reassigned staff to support the CFTEP:

Dedicated Deer Feeding Staff were added.....

A dramatically enhanced role for epidemiologists was established and two fulltime epidemiologists were assigned to the program. In addition, epidemiologists in Austin (VS and TAHC) and Ft. Collins provide additional support.

IT support staff were assigned to the CFTEP to provide full-time onsite support....

Additional Mounted Patrol Inspectors were hired to work in Starr County.

-New management techniques and tools were instituted:

Written herd plans, epidemiology reports, mapping, RFID eartags, hand held PDA's, wands and the MIMS software

-Database development:

The 1943 based records system is being converted to modern databases. Initially, the Deer feeding program is utilizing an Access Database. The G-Card system of Infested Premises management is next in line for conversion. The CFTEP will utilize either off the shelf software or existing TAHC programs to accomplish this conversion.

-Increased Accountability for the Program and for Producers:

The new databases will allow a level of ongoing analysis that has never been possible in the CFTEP. Delinquent owners will be quickly identified and contacted to bring them into compliance. These tools will allow management to also assess the program effectiveness on an ongoing basis.

-Increased Visibility thru information dissemination: concise monthly reports will be produced and sent to decision makers.

-Future Tools: The CFTEP is working with ARS and FDA to assess and secure the availability of two new tools: a Tick Vaccine and Ivermectin / Molasses Tubs.

Texas Animal Health Commission (TAHC)

-TAHC added 5 permanent and 4 temporary inspectors to their work force in South Texas to assist with the tick eradication efforts. TAHC also initiated efforts to work closer with the Texas Parks and Wildlife agency to include biologist input into establishing the most efficient and effective deer feeding operations. TAHC fully supports changes in management and epidemiologic approaches to managing the fever tick zones , and passed rules to support the inclusion of epidemiology, and the utilization of herd plans to formalize testing agreements within the program.

Committee Business

The Committee reaffirmed support for the 2009 Resolution on continued long term funding for the international screwworm eradication program by the USDA.